

Gerald Gentleman Station

**Multi-Pollutant Controls Equipment
(MPCE) Project Update**

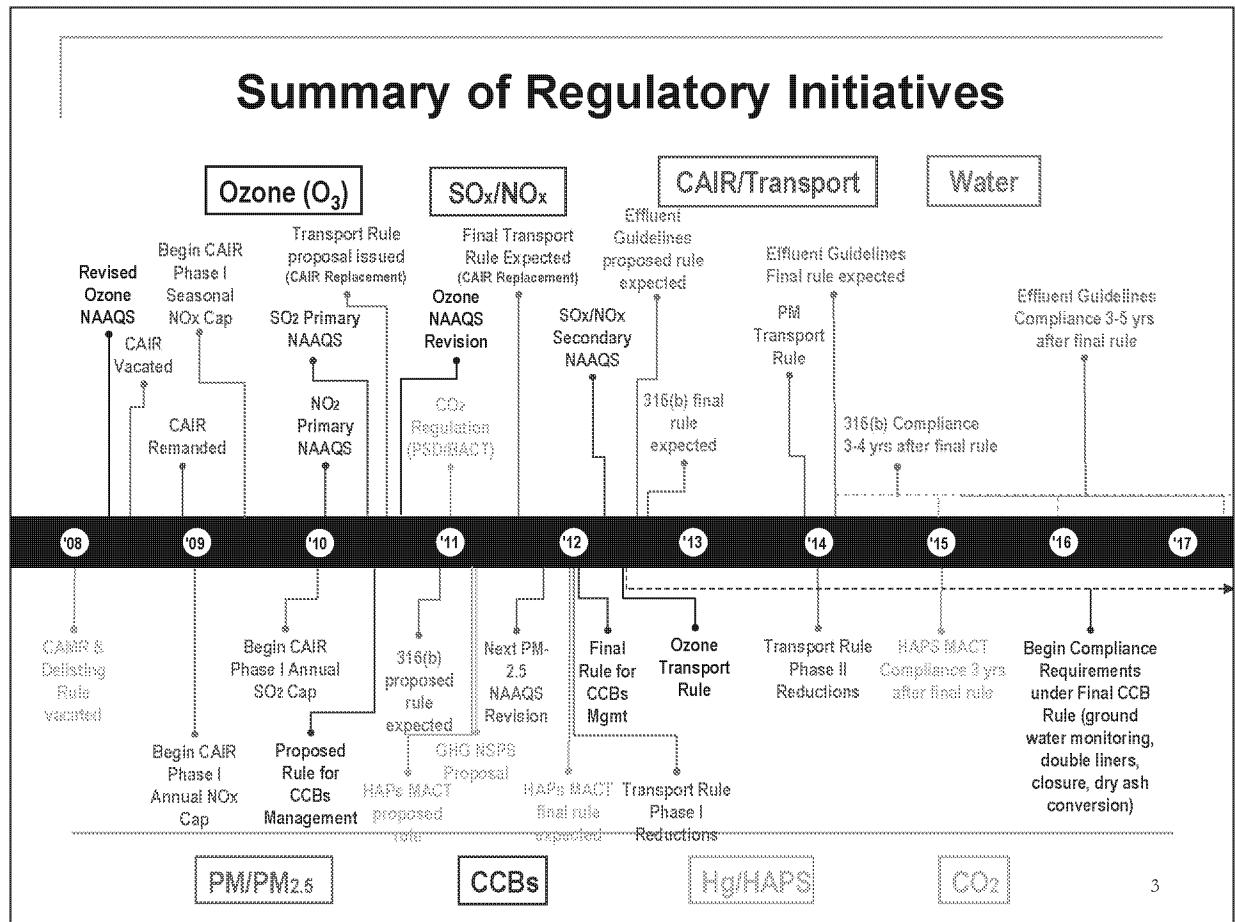
GGG Town Hall Meeting
September 2011

GGG MPCE Project Update

Background

■ **GGG impact assessment began in 2007**

- ❑ Due to actual and potential regulatory initiatives
- ❑ Determine impact on capital budget and time to implement
- ❑ Determine impact to operations and maintenance
- ❑ MPCE Core Team: John Meacham, Bob Nitsch, John Befort, Don Muhle, Kelly Barmore, Linda Holmstedt
- ❑ Sargent & Lundy Engineers providing engineering and permitting assistance
- ❑ Project put on hold as end of 2009



This is a summary of the regulatory initiatives that affect our existing and any new facilities.

Ozone, SO₂/NO_x, CAIR/Transport Rule, Water

Note EFFLUENT GUIDELINES

Haven't changed since 1986 – long overdue

will regulate scrubber waste for the first time

moving from technology based standards to water quality based standards

i.e., Chlorine 0.20 mg/l to 0.019 mg/l, a ten fold decrease.

Mike Linder, Director of the NDEQ, recently said water is the next big thing!

For example, water regulations may control your emissions, due to deposition.

PM₁₀ and PM_{2.5}, Coal Combustion byproducts, Mercury and other HAPS, and Finally CO₂

We'll discuss these rules in the following slides.

Keep in mind - All these rules are in the pipeline...

The regulatory express moves on...

GGG MPCE Project Update

Possible MPCE for GGS

■ **SO₂**

- Scrubbers (Wet or Dry)
 - Also called Flue Gas Desulfurization (FGD) units
- Dry Sorbent Injection (DSI)

■ **NO_x**

- Low NO_x Burners, plus Overfire Air
 - Selective Catalytic Reduction (SCR)
 - Selective Non-Catalytic Reduction (SNCR)
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Possible MPCE for GGS

■ Mercury

- Activated Carbon Injection (ACI), with or without additives (e.g., bromide)

■ Particulate Matter

- Baghouses

■ Emerging Technologies

- Several evaluated but none ready for units like GGS

GGs MPCE Project Update

What is the first step?

■ Combustion Optimization

- “Front end” to any new MPCE
- Required to meet CSAPR NO_x requirements
- For Unit 2: New low NO_x burners and overfire air
- For both units:
 - Pulverizer modifications
 - New fuel/air flow measuring and control equipment
 - New flue gas monitoring instruments (O₂, CO, NO_x)
- BART submittal contains a new NO_x limit

GGG MPCE Project Update

Current Status

- Based on “Train Wreck” chart, re-initiated work with S&L
- Assessing impacts of various regulations on GGS and SS
- Continuing with engineering and permitting activities for MPCE for GGS
- Goal is to be prepared by end of 2011 to take further action, if necessary

GGs MPCE Project Update

Current Status

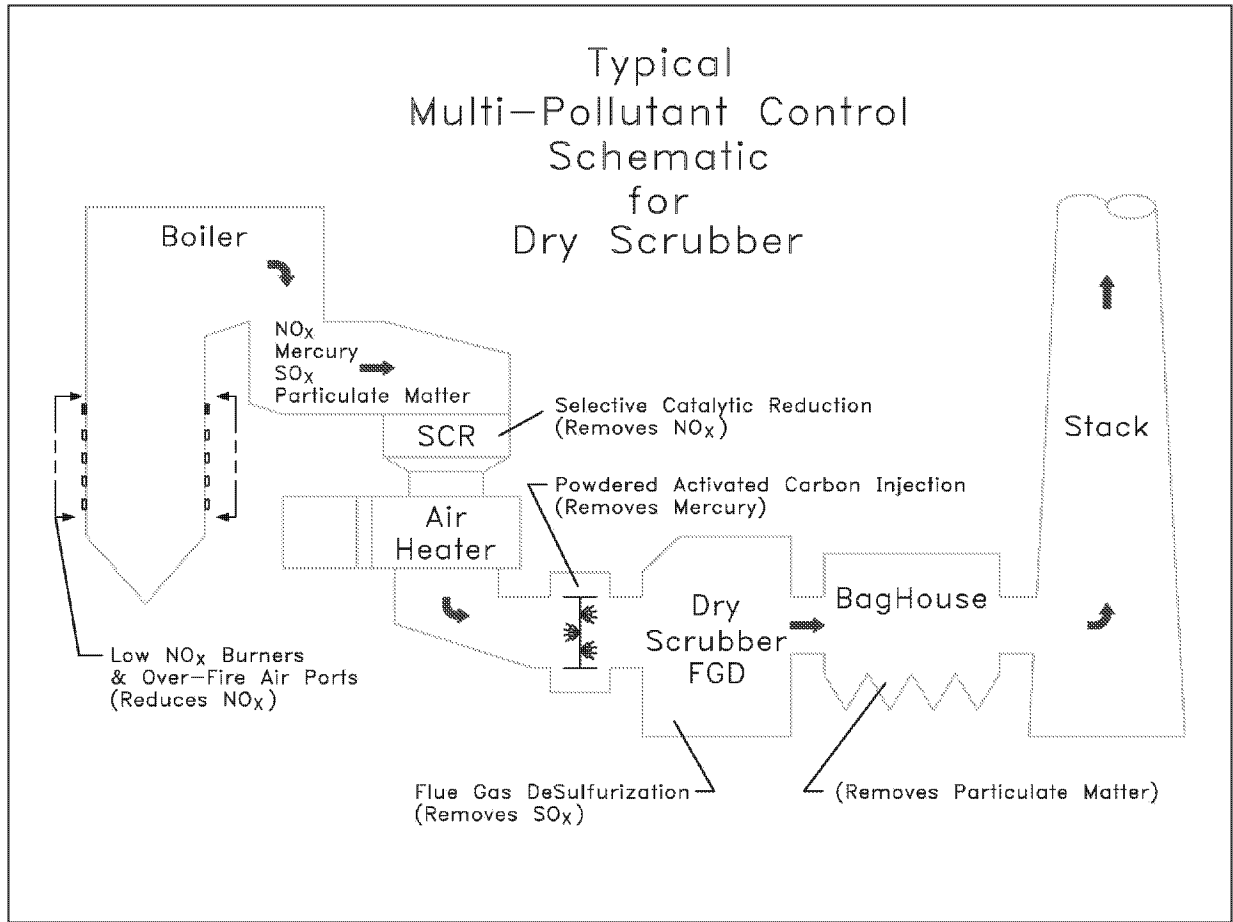
- Previous project cost estimates for GGS have been updated
 - Scrubbers: Approximately \$1 billion
 - SCR equipment: Approximately \$500 million
- Per current schedule (subject to change), equipment tie-ins are planned for:
 - 2016 for Unit 2
 - 2017 for Unit 1

GGG MPCE Project Update

MPCE Overview

For

GGG

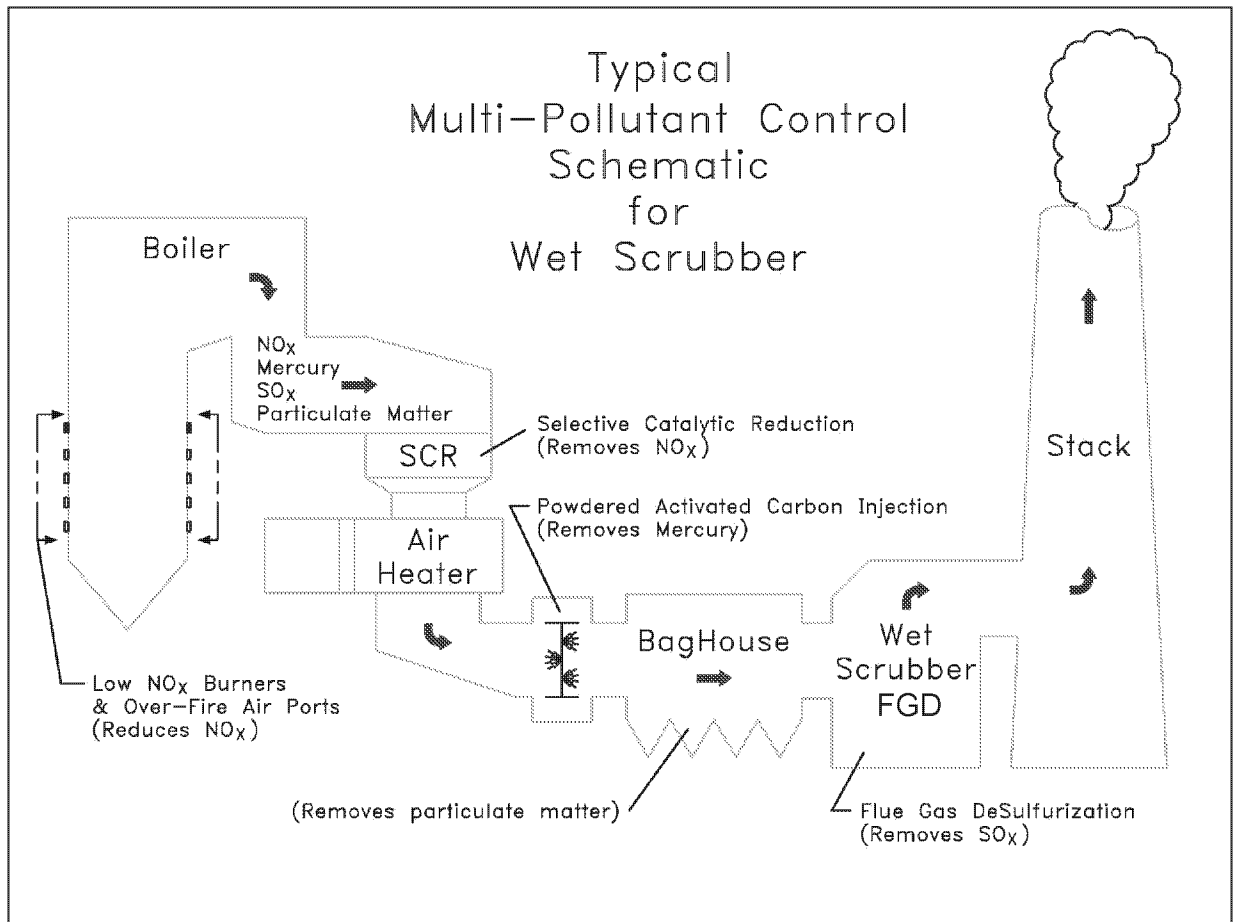




DRY FGD WITH SCR

11

DRY FGD WITH SCR
DRY FGD WITH SCR





WET FGD WITH SCR

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Questions?